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Docket GE134003

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:
B.K. Doloresco et al

Art Unit: 3745

Application No.: 10/634,545
Confirmation No: 6042

Examiner: Edgar, R.

Filed: 08/05/2003

Title: Counterstagger Compressor Airfoil

Response

Mail Stop Non-Fee Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the office action dated as mailed on 11/19/04, and having a period of response extending through and including 02/19/05, Applicants request reconsideration of the above identified application.

Applicants traverse the failure to consider the IDS filed 8/5/2003 concurrently with the application.

Copies of all references AA to AI and AR as listed in the form PTO-1449 were sent to the USPTO in the same Express Mail envelope concurrently with the remainder of the application.

Transmittal form PTO/SB/05 (of record) lists the

CERTIFICATE OF TRANSMISSION (37 CFR 1.8a and MPEP 512)

I hereby certify that this 15-PAGE correspondence is being facsimile transmitted to the U.S. Patent and Trademark Office at Fax No. 703-872-9306 on the transmission date indicated below.

FRANCIS L. CONTE

(Name of person transmitting paper)

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13 January 2005

(Date)

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inclusion of the references in the second box at 12, which is evidence that they were in fact provided to the USPTO.

The return receipt postcard also lists in item 9 that the references were sent to the USPTO, which is further evidence that they were in fact submitted.

Accordingly, the available evidence shows that all listed references were in fact submitted to the USPTO in accordance with Rule 98.

However, instead of having the USPTO search its files for the apparently missing Smith reference AR, Applicants are filing concurrently herewith as a courtesy to the examiner a Supplemental Information Disclosure Statement, including another copy of the Smith reference.

Although the examiner has initialed references AA to AI in the form PTO-1449 to indicate due consideration thereof, the examiner's comment on page 2 of the office action that "It has been placed in the application file ...[and] has not been considered" places in doubt whether or not the references have been duly considered.

Accordingly, the SIDS now being filed not only re-lists the previously submitted references, but also adds references thereto.

All references listed in the SIDS should now be evaluated de novo by the examiner in accordance with applicable Rules, and all of these references should be initialed in the new form PTO-1449 as duly considered by the examiner in the next office action.

Applicants traverse the rejection of claims 1 and 11-17 under Section 102(b) over Lammas et al.

Applicants note the substantial breadth of interpretation of Applicants' claims being proffered by the examiner, which correspondingly enlarges claim scope in later infringement analysis of the file wrapper. However, the examiner has failed to afford due weight to specific features

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and cooperation of features which distinguish over the applied art.

The examiner's rejections under Section 102, as well as those under Section 103, fail together for improperly construing the claims as written, and since the applied references neither disclose nor suggest these claims.

Applicants traverse the examiner's basic contention that: "Applicants's use of the term 'stagger' seems to be consistent with the art term 'bow' for describing the airfoil geometry, and 'dihedral' is synonymous with 'lean'." The examiner's additional use of the "bowing" description fails to address the claims as written, and is fundamentally erroneous.

MPEP sections 2173.02 and 2173.05(a), for example, indicate that the examiner's interpretation of the claims may be the broadest reasonable interpretation, but that must be consistent with the written specification as would be read by one skilled in the art.

Furthermore, in *Lindemann Maschinenfabrik GmbH v. American Hoist and Derrick Co.*, 730 F.2d 1452, 221 USPQ 481 (Fed. Cir. 1984), anticipation requirements under 35 U.S.C. §102 are presented as follows:

Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim. In deciding the issue of anticipation, the trier of fact must identify the elements of the claims, determine their meaning in light of the specification and prosecution history, and identify corresponding elements disclosed in the allegedly anticipating reference. (citations omitted).

The Board of Patent Appeals and Interferences in *Ex parte Levy*, 17 USPQ2d 1461, 1462 (B.P.A.I. 1990) cites *Lindemann* to place the burden of proof upon the examiner as follows:

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Moreover, it is incumbent upon the examiner to identify wherein each and every facet of the claimed invention is disclosed in the applied reference.

Furthermore, the Federal Circuit further held in *Lewmar Marine, Inc. v. Barient, Inc.*, 3 USPQ2d 1766, (1987), cert. denied, 108 S.Ct. 702 (1988) that:

"[t]hat which would literally infringe if later in time anticipates if earlier than the date of invention."

Accordingly, anticipation under 35 U.S.C. §102 requires disclosure by a single reference of each and every element recited in a claim functioning in the same manner to produce the same result as the claimed invention.

It is quite apparent that the various blades disclosed in Lammas are quite different than the airfoils recited in Applicants' claims, and that this reference fails to disclose or suggest these claims.

Fundamental to independent claims 1 and 11 is the recitation of the airfoil stagger increasing above the root 34, and decreasing above a midspan pitch section 40 of the airfoil.

The examiner has clearly not interpreted "stagger" in accordance with Applicants' specification, or for that matter, in accordance with any reference of record, including the Lammas reference being applied.

The examiner has failed to explain why the term stagger has not been interpreted in accordance with the specification; and the examiner has failed to identify any support in the Lammas reference to support his proffered "consistent" position.

To the contrary, there appears to be no "stagger" term being used in Lammas, and the examiner has not shown

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otherwise.

However, Lammas does use the term "bowed" at col. 3, l. 43 for example, in describing figure 9 being applied by the examiner.

But, Lammas also describes that the "Airfoil section 202 is bowed, and extends along radial line R(AS)" In other words the "bowing" is along the radial span of the airfoil.

This term "bowing," along the radial span, is consistent with other art-term usage thereof, including reference Liu et al.

Even Applicants' use the term "bow" consistent with references Lammas and Liu "along the radial span" as found in para. 32. Note also that claims 8,16 specifically recite that the stagger varies along the leading edge 30 to bow the leading edge concave in span along the suction side 28."

So, if the examiner is equating "stagger" with "bow," what then is the meaning of Applicants' claims 8,16?

The common principle of claim differentiation requires different interpretation of "stagger" and "bow" in claims 8,16, which would be defeated by the examiner's interpretation, and would not be consistent with either Applicants' written specification or the art of record.

The term "stagger" as recited in the claims is conventional as indicated by para. 41 of the specification, for example, and is also found in reference Liu et al as the twist or stagger angle from the chord, and is not the same as "bowed" as the examiner opines without evidentiary support.

Stagger is introduced at para. 25 of the specification, and at para. 27 the stagger angle Λ is disclosed in detail as shown in figures 3 and 4.

In other words, the stagger recited in the claims is the same as the twisting of the airfoil around the radial axis, which is in a different plane than any bowing along that radial axis as disclosed at para. 32.

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Figure 3 clearly illustrates the stagger angle A as measured between the chord C and the X axis.

Figure 4 is a plot of the stagger angle A from root to tip of the airfoil span. Although the graph illustrated in figure 4 has a "bow" in the curve of the stagger angles A along that span, that "bow" is not "consistent" with the term "stagger" as used in the claims, and the examiner has not shown otherwise.

So, what is the real "stagger" disclosed in Lammas?

The examiner has used figure 2 in Lammas, but note how conspicuously the airfoil 52 shown therein twists clockwise from root to tip, which twisting, or stagger, appears to increase continuously.

Independent claims 1 and 11 require both increase and decrease of the airfoil stagger which is clearly not disclosed by Lammas, including its figure 2.

Figure 9 being used by the examiner for the radial "bow" of the airfoil 202 has no relevance to the stagger feature recited in the claims, and without more evidence in Lammas any stagger of the various radial sections in figure 9 would appear to be constant from root to tip, with no indication of any variation thereof in this figure.

Figure 11 of Lammas shows one cross section of figure 10, and the stagger or twist angle of those cross sections would appear to be constant from root to tip, unless Lammas discloses otherwise.

Accordingly, the examiner has failed to provide any evidence in the references to support his interpretation of equating stagger with bow, when the evidence is clearly to the contrary.

The examiner has also failed to afford due weight to the recited stagger feature in accordance with Applicants' specification, and has failed to identify any legal support in the statute, Rules, case law, or the MPEP which permits

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disregarding Applicants' specification as the basis to interpret special terms expressly recited in the claims.

Claim 12 recites that the stagger increases in magnitude from the root 34 to the pitch section, and decreases in magnitude above the pitch section toward the root stagger magnitude.

The examiner's attempt to use the bow illustrated in figure 9 of Lammas fails ab initio to support this rejection.

There is no stagger, other than constant, shown or suggested in figure 9 of Lammas, and the examiner has not shown otherwise.

And, figure 2 of Lammas clearly illustrates stagger or twist increasing continuously from root to tip. In this regard, see para. 29 wherein the present Applicants expressly state the conventionality of such increasing twist, over which the present claims are a distinct improvement.

Claim 16 recites that the stagger varies along the leading edge 30 to bow the leading edge concave in span along the suction side 28. This is shown in figure 3 and disclosed at para. 36.

The examiner has failed to identify any analogous structure in Lammas; and his mere contention that "Fig. 9 clearly shows the concave bow" is evidence of the failure to afford due weight to the express claim language, and is further evidence that the mere schematic of figure 9 is being used for more than is commensurate with that schematic depiction.

The examiner attempts to use figure 9 of Lammas for pressure and suction sides, and leading and trailing edges "wherein the airfoil is bowed along the radial direction," yet such bowing has no relevance to the stagger recited in the claims.

The radial bowing shown in figure 9 of Lammas is clearly for the entire airfoil along the radial axis R(AS), col. 3,

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11. 43+, and does not appear to bow the leading edge thereof concave in span along the suction side.

To the contrary, the airfoil bow shown in figure 9 of Lammas appears to bow convex the leading edge on the suction side, right side per rotation direction D, while the pressure side would be bowed concave. This is opposite to the bow recited in claim 16 which the examiner has overlooked in his mere contention that "Fig. 9 clearly shows the concave bow."

The examiner also merely contends that "'dihedral' is synonymous with 'lean'," yet has provided no evidence of this definition, and has disregarded the art of record, and Applicants' specification.

"Dihedral" is a term of art as introduced at para. 33 and is "the angle B between the local surface of the airfoil and the surrounding casing 18 illustrated in Figure 1."

In figure 9 of Lammas, the radial line R(AS) is bowed which in turn bows the entire airfoil 202.

In claims 1 and 13 the dihedral angle increases in conjunction with the increasing-decreasing stagger in a combination clearly not disclosed or suggested by Lammas.

The examiner is attempting to use naked elements of Lammas out of context and without regard to the cooperation thereof in an operative airfoil; and has therefore failed to identify the specific combinations being recited which must be found in those specific combinations to be rejected under Section 102.

Claim 14 recites that the dihedral angle above the pitch section 40 is opposite to the dihedral angle between the root 34 and pitch section, yet again in combination with the increasing-decreasing stagger feature.

The bowed airfoil 202 of figure 9 of Lammas clearly does not disclose this combination of elements. The examiner's mere contention that Lammas shows "opposite lean angles at the root and tip of the airfoil" overlooks the requisite

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combination of features, clearly lacking in Lammas.

Claim 15 recites that the dihedral angle along the leading edge 30 at the tip 36 is greater than below the pitch section 40, again in combination with the increasing-decreasing stagger, not disclosed in Lammas.

The examiner has also failed to provide any evidence in Lammas of the magnitude of the bowed airfoil 202 in figure 9.

That figure is expressly stated as being a mere "schematic" and no objective magnitudes of bow or dihedral are disclosed.

See, in contrast, the graph of figure 5 in Applicants' drawings which contains numerical values of the leading edge dihedral angles, clearly missing in Lammas.

The examiner's mere contention that "the tip angle is larger than the negative root angle" overlooks the schematic nature of figure 9.

Claim 17 recites that the dihedral angle is unidirectional along the tip 36 between the leading and trailing edges 30,32.

The examiner has failed to identify any evidence in Lammas to support the rejection of claim 17 since figure 9 of Lammas is clearly a schematic and clearly fails to illustrate any bowing in different planes between the leading and trailing edges.

See for example the substantial twist angle illustrated in figure 2 of Lammas. How would that airfoil twist be introduced in the airfoil schematic of figure 9 in accordance with conventional practice?

What is the significance of the examiner's statement on page 3 that: "Fig. 2 shows the axial dimension of the airfoil which does not vary in the axial direction?" What claim does this pertain to? Claim 17?

The airfoil 52 in figure 2 of Lammas is different than the airfoil 202 of Lammas, so what combination does the examiner contend, and where is the evidence thereof?

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The examiner's attempt to select isolated features from the different embodiments of Lammas is additional evidence of the failure to meet the stringent requirements of Section 102.

It is the examiner who must establish anticipation using demonstrable evidence in a single reference and a single embodiment, and the examiner cannot rely on commingling multiple embodiments, and the silence of a reference in supporting that anticipation.

Accordingly, withdrawal of the rejection of claims 1 and 11-17 under Section 102(b) over Lammas et al is warranted and is requested.

Applicants traverse the omnibus rejection of claims 2-10 and 18-20 under Section 103(a) over Lammas et al and Spear et al.

As indicated above, the examiner's mere use of a "bowed airfoil" in Lammas fails to afford due weight to express claim language, and since Lammas clearly lacks any relevant teaching of the varying stagger recited in these claims, the rejection must fail ab initio since Spear is being used solely for airfoil sweep, without regard to context.

The requirements for a rejection under Section 103 are quite stringent under MPEP chapters 700 and 2100, and the examiner has clearly failed to comply therewith.

The examiner's precision use of only sweep from Spear is clear evidence of the failure to consider these references in the whole, and Applicants' claims in the whole; and also evidence impermissible hindsight reconstruction.

The examiner has failed to address the actual claim features, and has combined Lammas and Spear without regard to the problems therein, and without providing any evidence of legal motivation to combine the references.

The examiner's stated reason "for the purpose of reducing endwall shock" fails to explain what combination is

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being taught, and is a mere hindsight conclusion and is not legal motivation.

Legal motivation requires evidence in the references themselves which teaches why and how they should be combined.

Where is any problem stated in Lammas for which the examiner's proposed solution in Spear would have been relevant?

Claims 6 & 18 recite forward aerodynamic sweep at both the leading and trailing edges 30,32 of the tip 36 in an airfoil have increasing-decreasing stagger.

The examiner has failed to show any commonality between the basic airfoils of Lammas and Spear for which any combination thereof would be warranted.

And, although the figure 6 embodiment of Spear shows forward sweep, col. 5, ll. 22+, that forward sweep is specifically at the leading edge, and there is no corresponding teaching in Spear to also introduce forward sweep at the trailing edge.

Aerodynamic sweep is a highly complex and sophisticated feature as well evidenced by the references of record, and the examiner has failed to provide any teaching in Spear of forward sweep for both the leading and trailing edges in a single airfoil.

The examiner's mere reference to "column 1, lines 54-64" of Spear, fails to support his rejection, and is inconsistent with the express teachings of Spear in the subsequent "Best Mode" section.

Claims 7 and 19 introduce aft aerodynamic sweep from the root 34 to the pitch section 40 and to below the tip 36 along the leading and trailing edges 30,32.

Spear is expressly silent, col. 5, ll. 63+, on the configuration of the blades below the inner transition radius, and therefore lacks the requisite evidence to support the rejection of claims 7 and 19.

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The examiner should note that Applicants' specification well explains the complex and sophisticated nature of compressor blades, and that the many, many geometrical features thereof cooperate in the final performance thereof.

Accordingly, the examiner is not permitted to uncover naked references in the art and combine different features thereof without regard to how one skilled in the art would evaluate those references, and possibly combine them, if at all.

The examiner must necessarily employ hindsight in fabricating claim rejections, but the requirements of the MPEP are stringent, and intended to evaluate references objectively and combine them where combinable for reasons expressly found in the references.

The examiner's surgical combination of the different features of Lammas and Spear is clear evidence of impermissible hindsight since the two references disclose different blades and different problems and different solutions.

The examiner, instead of considering these basic teachings, directly utilizes Spear without regard to the fundamental differences but solely for its naked teaching of sweep.

However, the prior art is replete with many references which disclose and claim airfoils with different features of sweep. Yet, all such references cannot be combined, absent the requisite, and stringent, showing mandated by the MPEP.

The examiner's comments in the Section 103 rejection pertain only to the sweep claims 6, 7, 18, and 19, and conspicuously overlook the other claims being rejected.

Claims 2 and 20 introduce a concave axial projection along the leading edge 30, with the root 34 and tip 36 extending forward of the pitch section 40 along the leading edge. The examiner has not addressed this claim.

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Figure 9 of Lammas is clearly not an axial projection view.

And, indeed, figure 2 also being used by the examiner appears to show a straight leading edge without any concave feature. The swept blade of Spear is not relevant in this regard especially since the blade forms are fundamentally different.

Claims 3-5 have also been overlooked by the examiner. These claims introduce features like claims 12, 14, and 15, and are well distinguishable over Lammas as indicated above, with the examiner failing to show any relevancy thereto in Spear.

Claims 8 & 9 have also been overlooked by the examiner. These claims introduce features like claims 16 and 17, and are well distinguishable over Lammas as indicated above, with the examiner failing to show any relevancy thereto in Spear.

Claim 10 recites that the stagger has a maximum value located in a range of about 60%-85% span from the root 34.

Yet again, the examiner has overlooked this claim.

Lammas clearly shows in figure 2 twist increasing to its maximum value at the blade tip, or 100% span.

And, the examiner's use of bow in figure 9 of Lammas fails to show where that maximum bow is located; perhaps near the root, perhaps near the mid-span, or perhaps near the tip.

But, where is any teaching in Lammas of maximum stagger at 60-85%?

Accordingly, withdrawal of the omnibus rejection of claims 2-10 and 18-20 under Section 103(a) over Lammas et al and Spear et al is warranted and is requested.

Mindful of the typical practice in the USPTO to interpret claims ever so broadly, Applicants request that the examiner reconsider the claims and these remarks in accordance with the applicable MPEP provisions.

There can be no doubt that the stagger feature expressly

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recited in the claims has a corresponding mean as well evident from the specification, and the art of record, and clearly is not the same as the radial bow being proffered by the examiner.

The stagger angle as disclosed in the specification is a physical attribute which determines the relative twist of the airfoil around its radial axis, notwithstanding that that radial axis itself might be bowed along the radial span in the manner that the airfoil illustrated in figure 9 of Lammas is bowed along the radial span therein.

However, figure 9 of Lammas clearly does not show any stagger feature since this is a vertical or radial plane, and stagger would only be visible in a top or circumferential plane like that illustrated in figure 11 of Lammas, or an isometric view like figure 2 in which the twist clearly increases from root to tip.

If the examiner continues to feel warranted in his interpretation of the stagger feature, then the examiner is respectfully requested to provide specific legal support therefor in the MPEP and or specific case law references for further evaluation by Applicants' attorney.

At that time, Applicants would consider further qualifying the stagger feature of the claims if required to obtain the definition thereof as presented in the specification, and as illustrated in the figures.

As indicated above, Applicants are filing concurrently herewith a SIDS listing the original references, adding references, and providing yet another copy of the Smith reference which the examiner was unable to locate.

In accordance with the duty imposed by 37 CFR 1.104 and MPEP sections 707, 707.05, 707.07, and 707.07(g), the examiner is requested to reconsider all the art of record, including the additional references being cited, to ensure full compliance with the required thoroughness of

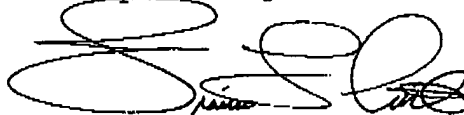
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examination.

In re Portola Packaging, Inc., 42 USPQ2d 1295 (Fed. Cir. 1997) emphasizes the importance of complying with this duty to ensure that all references of record have been fully considered by the examiner in the various combinations thereof. And, the Board of Appeals has further elaborated on the importance of this examiner duty in Ex parte Schricker, 56 USPQ2d 1723 (B.P.A.I. 2000).

In view of the above remarks, allowance of all claims 1-20 over the art of record is warranted and is requested.

Respectfully submitted,



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